

What is claimed is:

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1 1. A method for printing with a bidirectional inkjet printer, comprising:
2 converting a first set of color pixel data having a direction-independent data format
3 into a second set of color pixel data having a direction-dependent data format, the
4 direction-dependent data format including at least one direction-independent data segment
5 and at least one pair of direction-dependent data segments; and
6 selecting the at least one direction-independent data segment and one of each of
7 the at least one pair of direction-dependent data segments for printing the second set of
8 color pixel data in a corresponding print direction.

1 2. The method of claim 1, wherein the selecting further includes:
2 selecting the at least one direction-independent data segment and one of each of
3 the at least one pair of direction-dependent data segments for printing the second set of
4 color pixel data in a forward direction; and
5 selecting the at least one direction-independent data segment and the other one of
6 each of the at least one pair of direction-dependent data segments for printing the second
7 set of color pixel data in a rearward direction.

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1 3. The method of claim 1, wherein the converting and selecting operate such that a
2 data region in the first set representative of a particular color has the same perceived color
3 when printed in a forward print direction and a rearward print direction.

1 4. The method of claim 1, comprising:
2 receiving a plurality of first sets of color pixel data;
3 determining for each first set of color pixel data the corresponding print direction
4 for the corresponding second set of color pixel data; and
5 printing the selected data segments for each second set of color pixel data.

1 5. The method of claim 4, wherein the printing of all data segments of an individual
2 second set of color pixel data is performed in a single scan.

1 6. The method of claim 1, wherein the first set of color pixel data is in RGB
2 format.

1 7. The method of claim 6, wherein the second set of color pixel data is in
2 KYCMC'M' format.

1 8. The method of claim 6, wherein the second set of color pixel data is in
2 KYcmCMC'M' format.

1 9. The method of claim 7, wherein the at least one direction-independent data
2 segment is a K data segment and a Y data segment, and wherein the at least one pair of

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3 direction-dependent data segments are a C and C' pair of data segments and an M and M'
4 pair of data segments.

1 10. The method of claim 7, wherein the at least one direction-independent data
2 segment is a C data segment and an M data segment, and wherein the at least one pair of
3 direction-dependent data segments are a K and K' pair of data segments and a Y and Y'
4 pair of data segments.

1 11. The method of claim 1, wherein the first set of color pixel data is continuous-
2 toned data and the second set of color pixel data is halftoned data wherein each individual
3 data element represents a discrete color printable by the inkjet printer.

1 12. The method of claim 11, wherein the converting further comprises:
2 color-converting the first set of color pixel data into an intermediate set of
3 continuous-toned direction-dependent color pixel data; and
4 halftoning the intermediate set to form the second set of color pixel data in which
5 each individual data element represents a discrete color printable by the inkjet printer

1 13. The method of claim 1, wherein each direction-independent data segment and
2 each pair of direction-dependent data segments is associated with a different color ink.

1 14. The method of claim 1, wherein each individual one of the pair of direction-
2 dependent data segments is associated with a same color ink.

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1 15. A color map for converting an input pixel having a print-direction-independent
2 color into an output pixel having a print-direction-dependent color, comprising:

3 a plurality of table entries, each entry having a discrete input color value and a
4 corresponding discrete output color value;

5 wherein each input color value further comprises a prespecified combination of
6 primitive values for print-direction-independent input color primitives, and

7 wherein each output color value further comprises a prespecified combination of
8 primitive values for at least one print-direction-independent output color primitive and at
9 least one pair of print-direction-dependent output color primitives.

1 16. The color map of claim 15, wherein:

2 each print-direction-independent output color primitive is associated with a
3 different one of a set of first colors,

4 each pair of print-direction-dependent output color primitives is associated with a
5 different one of a set of second colors, and

6 both individual ones of each pair of print-direction-dependent output color
7 primitives are associated with a same one of the set of second colors.

1 17. The color map of claim 15, wherein:

2 the print-direction-independent input color primitives are red, green, and blue;

3 the at least one print-direction-independent output color primitive are black and
4 yellow; and

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5 the at least one pair of print-direction-dependent output color primitives are
6 forward-print-direction cyan and rearward-print-direction cyan, and forward-print-
7 direction magenta and rearward-print-direction magenta.

1 18. The color map of claim 15, wherein:
2 the print-direction-independent input color primitives are red, green, and blue;
3 the at least one print-direction-independent output color primitive are black,
4 yellow, light cyan, and light magenta; and
5 the at least one pair of print-direction-dependent output color primitives are
6 forward-print-direction dark cyan and rearward-print-direction dark cyan, and forward-
7 print-direction dark magenta and rearward-print-direction dark magenta.

1 19. The color map of claim 15, wherein:
2 the print-direction-independent input color primitives are red, green, and blue;
3 the at least one print-direction-independent output color primitive are magenta and
4 cyan; and
5 the at least one pair of print-direction-dependent output color primitives are
6 forward-print-direction black and rearward-print-direction black, and forward-print-
7 direction yellow and rearward-print-direction yellow.

1 20. The color map of claim 15, wherein each of the at least one pair of print-
2 direction-dependent output color primitive values are different for at least some of the
3 table entries.

1 21. A color printing system, comprising:
2 a print engine for controllably ejecting drops of colored inks during bidirectional
3 scanning;
4 a color converter adapted to receive color print data and generate a set of data
5 channels relating to the colored inks, the data channels including at least one print-
6 direction-independent data channel and at least one pair of print-direction-dependent data
7 channels; and
8 a print controller communicatively coupled to the color converter for receiving the
9 data channels and to the print engine for controlling the scanning direction and the
10 ejecting, the controller configured to print data from the at least one print-direction-
11 independent data channel during scanning in both directions and from a different one of
12 the at least one pair of print-direction-dependent data channels during scanning in each
13 opposite direction.

1 22. The color printing system of claim 21, wherein the color print data is
2 continuously-toned and the set of data channels is halftoned, and wherein the color
3 converter further comprises:
4 a color mapper adapted to receive the color print data and generate a
5 continuously-toned set of intermediate data channels according to a color map; and
6 a halftoner communicatively coupled to the color mapper for converting the
7 continuously-toned set of intermediate data channels to the halftoned set of data channels

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1 23. A color printing system, comprising:
2 a print engine for controllably ejecting drops of colored inks during bidirectional
3 scanning;
4 a color converter adapted to receive color print data and generate a set of data
5 channels relating to the ink colors of the system, the data channels including a single data
6 channel for some ink colors and a pair of data channels for other ink colors; and
7 a print controller communicatively coupled to the color converter for receiving the
8 data channels and to the print engine for controlling the scanning direction and the
9 ejecting, the controller configured to determine which of the pair of data channels to use
10 during printing in a particular scanning direction so as to cause a particular color of print
11 data to have the same perceived color when printed in either scanning direction.

1 24. The color printing system of claim 23, wherein the color converter generates
2 the set of data channels without knowledge of the particular scanning direction.